



1 signal usable to drive a display” (as per Claim 57), and “a signal processor” (as per Claim 72) are  
2 also not described in the specification. In light of the amendments and the discussion presented  
3 below, applicant respectfully disagrees for the following reasons.

4 The Standard for Rejections Based on the Written Description Requirement

5 The Examiner has issued several rejections based on failing to comply with the written  
6 description requirement. With respect to such rejections, applicant respectfully submits that  
7 MPEP 2163 establishes certain standards for making such a determination. The most basic standard  
8 is that the rejection must be analyzed with respect to one of ordinary skill in the art (i.e., to satisfy the  
9 written description requirement, a patent specification must describe the claimed invention in  
10 sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of  
11 the claimed invention). Applicant respectfully submits that when the specification is reviewed based  
12 on knowledge generally available to an artisan of ordinary skill, there is no reasonable basis for  
13 concluding that applicant has failed to comply with the written description requirement. Should the  
14 Examiner disagree with applicant’s traversal of the rejections identified below, applicant respectfully  
15 requests the Examiner to articulate reasons why a person skilled in the art would not recognize that  
16 the written description of the invention provides support for the claims.

17 The Written Description of the Term *Digital Imaging Sensor*

18 The Examiner has asserted that the term “digital imaging sensor” is not described in the  
19 specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor,  
20 at the time the application was filed, had possession of the claimed invention. Applicant respectfully  
21 submits that the application as filed discloses a digital video camera, and that applicant’s reference to  
22 a digital video camera in the specification would allow one skilled in the art to reasonably conclude  
23 that the inventor had possession of a videoendoscopic surgery trainer comprising a digital imaging  
24 sensor, because as one of ordinary skill in the art would have readily recognized, a digital imaging  
25 sensor is an essential component of any digital camera/digital video camera. The application  
26 discloses: “*The digital camera is configured to capture a plurality of frames per second, such that the*  
27 *digital camera can provide a video feed...*” (specification, page 5, line 2) and “*The digital camera*  
28 *used in the working prototype is a QuickCam™ Messenger web camera...*” (specification, page 19,  
29 line 21). Disclosure of a web camera would convey to an artisan of ordinary skill that the inventor  
30 possessed the claimed apparatus, which recites a digital imaging sensor, because such an artisan

would have readily recognized that a web camera includes a digital imaging sensor packaged in a housing with a lens.

Claiming a “digital imaging sensor” is an example of a generic claim. MPEP 2163.05 reads: *there may be situations where one species adequately supports a genus.* For example, MPEP 2163.05 uses the example of In re Smythe, which upheld the addition of a generic claim. The disclosure of “*air or other gas which is inert to the liquid*” was used as written support for the element *inert fluid media* recited in the claims, because the description of the properties and functions of the gas segmentizing medium would have suggested to an artisan of ordinary skill that the invention included the use of an *inert fluid*. Analogously, applicant disclosed a web camera, and the description of the properties and functions of the web camera, and its well known use of a digital imaging sensor would suggest to an artisan of ordinary skill that the invention encompassed the use of digital imaging sensors, because such sensors are the key functional component of a digital video camera. Just as the Smythe court allowed a generic claim because the generic claim shared the fundamental properties and functions disclosed in the specification for the invention, applicant respectfully requests Examiner accept the term “digital imaging sensor” as recited in the claims, because that term shares the fundamental properties and functions of the web camera disclosed in applicant’s specification.

Applicant respectfully submits that when analyzed from the basis of the knowledge of an artisan of ordinary skill, the specification as filed describes the claimed invention in sufficient detail that one skilled in the art would reasonably conclude that applicant had possession of the claimed invention, particularly because the artisan of ordinary skill would have recognized that digital imaging sensors are the heart of digital video cameras. If the Examiner continues to assert that a person having ordinary skill in the art would not reasonably conclude that applicant had possession of a videoendoscopic surgery trainer comprising a digital imaging sensor, applicant respectfully requests that the Examiner articulate how he can conclude that applicant was not in possession of a videoendoscopic surgery trainer comprising a digital imaging sensor, given that the digital imaging sensor is well known as a component of virtually every digital camera. Applicant thus respectfully requests that the rejection of Claims 50, 72, 75, and 81 be withdrawn.

1 The Written Description of the Term *Is Capable of Capturing At Least Thirty Frames per Second*

2 The Examiner has asserted that the term *is capable of capturing at least thirty frames per*  
3 *second* is not described in the specification in such a way as to reasonably convey to one skilled in  
4 the relevant art that the inventor, at the time the application was filed, had possession of the claimed  
5 invention. Applicant respectfully submits that the application as submitted discloses a digital camera  
6 which can capture 30 frames per second of video. The specification of the present application states:

7 The digital camera used in the working prototype is a QuickCam™ Messenger  
8 web camera available from Logitech Inc. of Fremont, CA. The QuickCam™  
9 Messenger is capable of a video capture resolution of up to 640 x 480 pixels, and a  
10 frame rate of up to 30 frames per second. The 30 frames per second rate is not  
11 comparable to broadcast television quality, yet still affords useful imagery. Lower  
12 frame rates result in a displayed image in which movements are jerky. Higher frame  
13 rates can provide a smoother, higher quality image. (Specification, page 19, line 24.)

14 The *30 frames per second rate* refers to the frame rate of a web camera that provides useful  
15 and relatively non-jerky imagery. As discussed in detail above, an artisan of ordinary skill would  
16 clearly recognize that digital imaging sensors are a key functional component (i.e., the heart) of  
17 digital video cameras/web cameras. Clearly, a digital camera that is capable of capturing at least  
18 30 frames of video per second can achieve that functionality because it includes a digital imaging  
19 sensor capable of capturing at least 30 frames of video per second. Therefore, an artisan of ordinary  
20 skill in the art would reasonably conclude that the inventor had possession of a digital imaging sensor  
21 capable of capturing at least 30 frames of video per second at the time of the invention. Accordingly,  
22 applicant respectfully requests the rejection of Claim 58 be withdrawn.

23 The Written Description of the Term *A Processor Configured to Generate a Signal Usable to...*

24 The Examiner has asserted that the term *a processor configured to generate a signal usable to*  
25 *drive a display* is not described in the specification in such a way as to reasonably convey to one  
26 skilled in the relevant art that the inventor, at the time the application was filed, had possession of the  
27 claimed invention. Applicant respectfully submits that the application as filed specifically discloses  
28 that image processing is generally required when using a digital video camera to drive a display as  
29 indicated in the excerpt found below:  
30

1 The output signal provided by the digital camera generally requires processing  
2 to achieve a video signal suitable for driving the display. Many displays are  
3 configured to process only video red, green, blue (RGB) analog signals. Some  
4 more expensive digital cameras include digital-to-analog circuitry that  
5 produces an analog output signal suitable to drive an analog display, although  
6 it is preferred to employ a low cost digital camera (to reduce the cost of the  
7 system), which typically does not provide a video analog output signal that can  
8 directly drive an analog display. Desktop personal and laptop computers are  
9 ubiquitous, and can readily accomplish the necessary digital-to-analog signal  
10 processing required to achieve an analog signal that can be displayed on  
11 equally ubiquitous RGB analog video monitors. Further, desktop personal and  
12 laptop computers can be used to perform signal processing required so that the  
13 output signal produced by a digital camera is converted to a display signal that  
14 can be used to drive many different types of displays. Indeed, the use of a  
15 computing device such as a desktop personal computer or a laptop computer  
16 enables relatively low cost web cameras to be utilized as the digital camera.  
17 Those of ordinary skill in the art will recognize that an output signal from a  
18 digital camera can be processed to produce a display signal for many different  
19 types of display devices, including televisions configured to display an NTSC  
20 signal, televisions configured to display a PAL signal, cathode ray tube based  
21 computer monitors, LCD monitors, and plasma displays. (Specification,  
22 page 13, line 13 to page 14, line 4.)

23 The specification explicitly describes that if a computing device is not used to provide the  
24 required signal processing when utilizing an inexpensive digital video camera that does not  
25 incorporate the digital-to-analog circuitry, then custom converter circuits can be employed.

26 *It should be further understood that converter 45 can be implemented using*  
27 *a laptop or personal computer, or less desirably, by a converter circuit*  
28 *specifically provided for this purpose.* Note that converter 45 is not required if  
29 display 38 is configured to utilize an output signal from the digital camera. It  
30 should be understood that converter 45 is configured to produce a display  
signal matched to the type of display 38 being employed. (Specification  
page 14, lines 9-16, emphasis added.)

Thus, the specification clearly discloses at least three types of signal processing: (1) digital-  
to-analog signal processing provided by relatively expensive digital video cameras including the  
required converter circuitry; (2) digital-to-analog signal processing provided by a laptop or desktop  
computer; and (3) digital-to-analog signal processing provided by a custom converter circuit. Having  
clearly disclosed three distinct mechanisms for providing the signal processing required to enable a

digital video camera signal to drive a display, it would appear reasonable to conclude that an artisan of ordinary skill would have recognized that applicant had possession of a *processor configured to generate a signal usable to drive a display* at the time of the invention. Accordingly, the written description rejection of Claim 57 should be withdrawn.

The Written Description of the Term *Signal Processor* in Claim 72

The Examiner has asserted that the term “*signal processor*” is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Applicant respectfully submits that the application as submitted discloses three embodiments of a *signal processor*, i.e., an expensive digital video camera including digital-to-analog circuitry, a computer configured to receive a digital video signal and convert it to an analog display signal, and a converter circuit configured to receive a digital video signal and convert that signal to an analog display signal.

With respect to the Examiner’s assertion that converter 45 cannot be interpreted as the signal processor as claimed, applicant respectfully submits that such an assertion appears poorly reasoned. As indicated in the excerpt from page 14 above, the specification as filed explicitly states that converter 45 can be implemented using a laptop or personal computer, or a converter circuit. The function of converter 45 is explicitly defined as providing digital-to-analog signal processing. The converter clearly provides processing and clearly can be implemented by a laptop or personal computer. There appears to be no reasonable basis to conclude that an artisan of ordinary skill, given applicant’s disclosure, would have concluded that, at the time of the invention, applicant did not possess a signal processor capable of performing digital-to-analog signal processing. That function is explicitly disclosed, and a plurality of different structures are disclosed that can be used to implement the function. Accordingly, the written description rejection of Claim 72 should be withdrawn.

Having addressed the written description rejections of each independent claim, it should be self-evident that the written description rejections of Claims 50-59 and 72-87 should also be withdrawn for the reasons discussed in detail above.

Rejections of Claims 24-26, and 49-92 under 35 U.S.C. § 112, second paragraph

The Examiner has rejected Claims 24-26 and 49-92 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention. In particular, the Examiner asserts that without the structural

elements of the display, the computing device, and the housing enabling insertion of elongate medical tools into the practice volume to perform a training exercise, the function of practicing videoendoscopic surgery techniques cannot be performed as claimed (as recited in Claims 24-26, 49-55, 58-61, 63-65, 67-75, 77-79, and 81-92). Further, the Examiner asserts that the meaning of “the elongate member movably supporting the digital video camera externally of the elongate member” (as per Claim 24) is not understood, and that the reference to “a digital imaging sensor” (as recited in Claims 50, 72, 75, and 81), and the references to: “is capable of capturing at least thirty frames per second” (in Claim 58), “a processor configured to generate a signal usable to drive a display” (in Claim 57), and “a signal processor” (in Claims 72 and 75) are all unclear. Applicant respectfully disagrees for the following reasons.

The Standard for Applying 35 U.S.C. § 112, Second Paragraph

The standard for applying a 35 U.S.C. § 112, second paragraph, rejection to a claim as being indefinite for failing to particularly point out and distinctly claim subject matter which applicant regards as the invention, is articulated in MPEP 2172: “*The invention set forth in the claims must be presumed, in the absence of evidence to the contrary, to be that which applicants regard as their invention.*”

Some rejections for indefiniteness by the Examiner assert that certain phrases are unclear. MPEP 2173.02 discusses how a question of indefiniteness is to be analyzed. In particular, MPEP 2173.02 indicates that “*Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the Examiner might desire.*” Furthermore, MPEP 2173.02 makes it clear that definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

Clearly, the claim language need not be the best possible claim language, but must merely be ascertainable to one of ordinary skill in the art.

1 Rejections of Claims 24-26, 49-55, 58-61, 63-65, 67-75, 77-79, and 81-92

2       The Examiner has rejected Claims 24-26, 49-55, 58-61, 63-65, 67-75, 77-79, and 81-92  
3 because the following structural elements are not positively recited: *a display, a computing device,*  
4 *and a housing enabling insertion of elongate medical tools into the practice volume to perform a*  
5 *training exercise.* Applicant respectfully submits that failure to limit the claims to include a personal  
6 computer, a display, or a housing enabling insertion of elongate medical tools does not warrant a  
7 35 U.S.C. § 112, second paragraph, rejection because, given the recitation included in the claims,  
8 there is no evidence that one of ordinary skill in the art would not have recognized the subject matter  
9 applicant regards as his invention. Simply because applicant's invention is usable with elements not  
10 specifically recited in the claims does not justify reaching the conclusion that there exists some  
11 indefiniteness with respect to what applicant regards as his invention.

12       A simplistic yet useful analogy is to consider a disclosure that describes a paintbrush. In its  
13 simplest form, a paintbrush comprises a handle portion configured to be manipulated by a user, and a  
14 bristle portion configured to transfer paint from a paint container to a surface. In describing a  
15 paintbrush, surfaces to be painted and paint will surely be discussed. However, the surface to be  
16 painted and the paint themselves should not be considered to be part of the invention. In the context  
17 of the present invention, the recited apparatus will be used with additional elements (for example, a  
18 display, medical tools, a simulated anatomical structure, an opaque cover, or a clear cover) in a  
19 training exercise.

20       With respect to a *display*, it is true that applicant's invention is intended to be used in  
21 connection with some type of display. To assert however, that an apparatus intended to be used in  
22 connection with some other apparatus must positively recite the element of each apparatus with  
23 which the invention is intended to be used is simply incorrect. A laparoscopic or endoscopic camera  
24 cannot be used without a display. There are numerous U.S. patents, some of which have been cited  
25 in applicant's Information Disclosure Statements submitted in connection with the present  
26 application, which include claims to laparoscopic or endoscopic cameras, but do not recite a display.  
27 Applicant has disclosed and claimed an apparatus that can be used for medical skills training.  
28 Applicant has specifically stated that such a trainer can be used with the relatively ubiquitous RGB  
29 analog and other types of monitors, and that with suitable processing, the output signal of a digital  
30 video camera can produce a display signal for input to many different types of display devices,



1 including televisions configured to display an NTSC signal, televisions configured to display a PAL  
2 signal, cathode ray tube based computer monitors, LCD monitors, and plasma displays. There simply  
3 is no patent rule or regulation requiring an apparatus intended to be used with a display to positively  
4 recite that display. Applicant respectfully requests the Examiner to withdraw this rejection, or  
5 provide some regulatory or statutory basis for requiring a display to be positively recited, and to  
6 present evidence that the claims as written are not what applicant regards as his invention.  
7 Accordingly, the rejection of all claims under 35 U.S.C. § 112, second paragraph, for failing to  
8 include the element of a display should be withdrawn.

9 With respect to a *computing device*, applicant has clearly described that a computing device  
10 can be used to implement digital-to-analog signal processing. A computing device is not specifically  
11 required, because, as is clearly described in the specification, some digital video cameras incorporate  
12 circuitry configured to implement such digital-to-analog signal processing. Furthermore, a converter  
13 circuit can be used in place of a computer to provide the digital-to-analog signal processing. Thus,  
14 while a computing device represents an example employed to implement digital-to-analog signal  
15 processing (and may be preferred because computing devices such as desktop and laptop computers  
16 are ubiquitous, and include a display), a computing device is not strictly required. Furthermore, since  
17 applicant has clearly described embodiments in which a computing device is not employed, there  
18 should be absolutely no confusion as to whether applicant regards a computing device as being a  
19 required or essential element of his invention or as being necessary to enable the claimed elements to  
20 be usable for training. Applicant respectfully requests the Examiner to withdraw this rejection, or  
21 provide some regulatory or statutory basis for requiring a computing device to be positively recited,  
22 and to present evidence that the claims as written are not what applicant regards as his invention.  
23 Accordingly, the rejection of all claims under 35 U.S.C. § 112, second paragraph, for failing to  
24 include the element of a computing device should be withdrawn.

25 With respect to a *housing enabling insertion of elongate medical tools into the practice*  
26 *volume*, it must be recognized that while the use of either a clear or opaque cover is preferred (opaque  
27 covers being particularly useful because they encourage the student to view the display, rather than  
28 looking directly into the practice volume), housing 36 includes an opening 34 easily large enough to  
29 accommodate the insertion of elongate medical tools into the practice volume. There simply is no  
30 patent rule or regulation requiring an apparatus, which in one exemplary embodiment includes either

1 an opaque or a clear cover, to positively claim that element. In other words, there is no requirement  
2 to recite in the claims, each and every element that is disclosed in the specification. Applicant  
3 respectfully requests the Examiner to withdraw this rejection, or provide some regulatory or statutory  
4 basis for requiring a more detailed description of the housing to be recited. Accordingly, the  
5 rejection of all claims under 35 U.S.C. § 112, second paragraph, for failing to include the element  
6 of a housing *enabling insertion of elongate medical tools into the practice volume* should be  
7 withdrawn.

8 In addition, it should be recognized that the claims at issue are apparatus claims defined by  
9 structure and not necessarily by function (except in the case where the function is explicitly recited in  
10 the body of the claim to further limit to a particular structure). MPEP 2114 states that “*features of an*  
11 *apparatus may be recited either structurally or functionally*”. The claim limitations as they exist are  
12 sufficient to describe the structure of a videoendoscopic surgery trainer. Such a structure, when  
13 coupled to a display and used with a simulated anatomical structure and elongate medical tools can  
14 indeed be used for training video endoscopic surgery. The preamble of the claims in question simply  
15 provides a context for the claimed apparatus’ structure. Therefore, the fact that additional useful  
16 elements could be used in conjunction with the apparatus during training exercises is not a valid basis  
17 for rejecting the claims.

18 Applicant respectfully submits that the claims as filed can be readily interpreted by one of  
19 ordinary skill in the art. There is no evidence that an artisan of ordinary skill would be unable to  
20 understand the scope of applicant's claims. While applicant may not have used the best language, or  
21 the language the Examiner believes applicant should have used, that is not the standard for an  
22 indefiniteness rejection. Therefore applicant respectfully requests the rejection of Claims 24-26, 49-  
23 55, 58-61, 63-65, 67-75, 77-79, and 81-92 as being indefinite be withdrawn.

24 The Clarity of the Term *Externally of the Elongate Member* in Claim 24

25 The Examiner has asserted that the meaning of *the elongate member movably supporting the*  
26 *digital video camera externally of the elongate member* is not understood. This phrase emphasizes  
27 that the location of the digital video camera is outside of (i.e., external to) the elongate member, as  
28 opposed to a camera that is contained within the confines of the elongate member, or a digital video  
29 camera that is built into the elongate member. This structure distinguishes over a laparoscope that  
30 includes a digital imaging sensor or digital video camera in the distal end of the laparoscope, because

1 the digital video camera/digital imaging sensor is fully encapsulated within a laparoscope (i.e., is  
2 disposed within the elongate structure of the laparoscope). Further, this configuration is clearly  
3 disclosed in applicant's specification and drawings as filed. The web camera or digital video camera  
4 is *attached* to a distal end of the elongate boom, not disposed *within* the elongate boom. As  
5 described in detail on the specification as filed, such a structure inexpensively duplicates the  
6 functionality (for training purposes) of a significantly more expensive laparoscope. Note that the  
7 recited structure cannot be substituted for a laparoscope during actual surgical procedures, because  
8 the digital video camera is not disposed within the confines of the elongate member. Particularly  
9 given the disclosure contained within the specification as filed, there is no evidence that an artisan of  
10 ordinary skill would be unable to understand the scope of applicant's claims. Accordingly, applicant  
11 respectfully requests that the rejection of Claim 24, and each claim dependent thereon, as being  
12 indefinite for the use of the term *externally of the elongate member*, be withdrawn.

13 The Clarity of the Term *Digital Imaging Sensor* in Claims 50, 72, 75, and 81

14 The Examiner has asserted that the meaning of a *digital imaging sensor* is unclear in  
15 claims 50, 72, 75, and 81. As noted above, the standard for interpreting the clarity of a claim with  
16 respect to an indefiniteness rejection is whether one possessing the ordinary level of skill in the  
17 pertinent art at the time the invention was made would have been able to ascertain the scope of the  
18 claims, see MPEP 2713.02. As discussed in detail above, an artisan of ordinary skill would have  
19 readily recognized the relationship between a digital imaging sensor and a digital video camera (i.e.,  
20 an artisan of ordinary skill would have recognized that a digital imaging sensor is the key functional  
21 component in a digital video camera, and that disclosure of a digital video camera inherently  
22 incorporates the disclosure of a digital imaging sensor). Furthermore, an artisan of ordinary skill  
23 would readily recognize that the term *digital imaging sensor* refers to a device which captures an  
24 image (in this case the image of a simulated anatomical structure being operated on) and outputs a  
25 signal containing a digital representation of said image, precisely the function disclosed in the  
26 specification as filed. Given the disclosure contained within the specification as filed, there is no  
27 evidence that an artisan of ordinary skill would be unable to understand the scope of applicant's  
28 claims. Accordingly, applicant respectfully requests the rejection of Claims 50, 72, 75, and 81, and  
29 each claim dependent thereon, as being indefinite for the use of the term *digital imaging sensor*, be  
30 withdrawn.

1 The Clarity of the Term *Capable of Capturing At Least Thirty Frames per Second* in Claim 58

2 The Examiner has asserted that the meaning of the term *capable of capturing at least thirty*  
3 *frames per second* is unclear in Claim 58. The specification as filed clearly discloses that a video  
4 frame rate of about 30 frames per second can support display of an image that while not of broadcast  
5 quality, is not so jerky as to be unusable. Such disclosure was in the context of a web camera, a  
6 particularly inexpensive type of digital video camera. As discussed above, an artisan of ordinary skill  
7 would readily recognize that such digital video cameras include digital imaging sensors capable of  
8 achieving the desired frame rate. Given such disclosure, there is no evidence that an artisan of  
9 ordinary skill would be unable to understand the scope of applicant's claims. Accordingly, applicant  
10 respectfully requests the rejection of Claim 58, as being indefinite for the use of the term *capable of*  
11 *capturing at least 30 frames per second*, be withdrawn.

12 If the Examiner continues to reject Claim 58 because he believes this term to be unclear,  
13 applicant respectfully requests the Examiner to state why one having ordinary skill in the art would  
14 not understand this phrase to have the ascribed meaning.

15 The Clarity of the Term *Processor Configured to Generate a Signal Usable to Drive a Display*

16 The Examiner has asserted that the meaning of *a processor configured to generate a signal*  
17 *usable to drive a display* is unclear in Claim 57. On its face, there does not appear to be anything  
18 ambiguous or indefinite about such language. The Examiner has not articulated any reason why one  
19 of ordinary skill in the art would have any difficulty understanding such language. The specification  
20 as filed *clearly* describes the need to ensure that the output signal from the digital video camera is  
21 compatible with the particular display that has been selected for viewing purposes. Relatively  
22 expensive digital video cameras sometimes include circuitry within the camera itself to convert a  
23 digital signal to an analog signal, such that the digital video camera can be coupled directly to an  
24 analog display. Relatively inexpensive digital video cameras, such as web cameras, require the use  
25 of a processor configured to convert the digital video signal output by the digital video camera into an  
26 analog signal that can be used to drive an analog display. The application as filed specifically  
27 discloses that computing devices can be used to perform such processing, or a custom converter  
28 circuit can be used to perform such processing. An artisan of ordinary skill would readily recognize  
29 that such processing is required whenever a digital imaging sensor is employed, regardless of whether  
30 the digital imaging sensor is used alone, or the digital imaging sensor is incorporated into a digital

1 video camera. There simply is no evidence that an artisan of ordinary skill would not be able to  
2 ascertain the scope of claims incorporating the term *a processor configured to generate a signal*  
3 *usable to drive a display*. Accordingly, applicant respectfully requests the rejection of Claim 57, as  
4 being indefinite for the use of the term *a processor configured to generate a signal usable to drive a*  
5 *display*, be withdrawn. If the Examiner continues to reject Claim 57 because he believes this term is  
6 unclear, applicant respectfully requests the Examiner state why one having ordinary skill in the art  
7 would not understand this phrase to have the ascribed meaning.

8 The Clarity of the Term *Signal Processor* in Claim 72

9 The Examiner has asserted that the meaning of *a signal processor* is unclear in Claim 72. The  
10 claim language explicitly states that the signal processor is *configured to receive and process the*  
11 *digital video signal from the digital image sensor, to provide a display video signal*. This function is  
12 entirely consistent with applicant's specification as filed. The Examiner has provided no articulation  
13 as to why an artisan of ordinary skill, given applicant's disclosure, would not be able to ascertain the  
14 scope of Claim 72 because of the term signal processor. Applicant respectfully submits that the  
15 *signal processor* is digital-to-analog converter 45, as shown in FIGURE 2 and described in the  
16 application at page 14, line 9. Digital-to-analog converter 45 processes the digital signal output from  
17 the digital imaging sensor, often a digital camera such as a web camera, and converts the digital  
18 signal into an analog signal matched to the type of display being employed. Processing a digital  
19 signal received from a digital video camera (which incorporates a digital image sensor as the primary  
20 functional component) to generate an analog signal to be used to drive an analog display is described  
21 in the application, and would be entirely understandable to an artisan of ordinary skill. Accordingly,  
22 the indefiniteness rejection of Claim 72 based on the use of the term *signal processor* should be  
23 withdrawn. If Examiner continues to reject Claim 72 based on the asserted indefiniteness of this  
24 term, applicant respectfully requests Examiner state why one having ordinary skill in the art would  
25 not understand this phrase to have the ascribed meaning.

26 Rejection of Claims under 35 U.S.C. § 102 as being anticipated by Hasson

27 The Examiner has rejected Claims 24-26, 49-56, 60-62, 64-70, 73, 74, 76, 77, 81-86, 88, and  
28 89 under 35 U.S.C. § 102 as being anticipated by Hasson (U.S. Patent No. 5,947,743). The Examiner  
29 asserts that Hasson discloses each element of applicant's claimed invention. In the light of the  
30

1 amendments and the discussion presented below, applicant respectfully disagrees for the following  
2 reasons.

3 Hasson discloses two cameras. Video camera 150 is located *outside* of the practice volume,  
4 and a distal end of laparoscopic camera 146 is inserted into the practice volume. Hasson provides  
5 absolutely no disclosure about the type of laparoscopic camera employed. One of ordinary skill in  
6 the art would generally recognize that a conventional laparoscopic camera comprises an optical fiber  
7 enclosed within a catheter. A camera is disposed at a proximal end of the catheter and is optically  
8 coupled with the optical fiber. The camera provides an output signal that is used to drive a display.  
9 Clearly, neither camera disclosed by Hasson is equivalent to a digital video camera disposed within a  
10 practice volume.

11 Even if, *arguendo*, laparoscopic camera 146 is considered to incorporate a digital imaging  
12 sensor in its distal tip, similar to the endoscope disclosed by Adair (U.S. Patent No. 6,211,904), such  
13 a structure is not equivalent to the structure recited in applicant's independent claims. Claim 24  
14 specifically recites *the elongate member movably supporting the digital video camera externally of*  
15 *the elongate member*. Thus, the digital video camera is not disposed within the elongate member, but  
16 instead, is disposed *externally* of the elongate member. Adair's endoscope has an imaging sensor  
17 disposed *within* the distal end of an endoscope. These structures are not equivalent, and there is  
18 simply no evidence that it would have been obvious to one of ordinary skill in the art to modify  
19 Adair's structure to achieve a structure equivalent to that recited by applicant. With respect to  
20 Adair's structure, removing the image sensor from within the protective confines of the endoscope  
21 would expose the image sensor to bodily fluids, and such a modification is clearly unsuitable for an  
22 endoscope used within a patient's body. Such a modification would render Adair's endoscope  
23 *unsuitable for its intended use*, and per MPEP 2143.01, obviousness cannot be established by such a  
24 modification if *the proposed modification would render the prior art invention being modified*  
25 *unsatisfactory for its intended purpose*. Because the cited art does not teach or suggest an equivalent  
26 structure, and because modification of the art would render a laparoscope taught by the prior art  
27 unsuitable for its intended purpose, Claim 24 is patently distinguishable over the cited art.

28 It is well recognized that dependent claims are patentable for at least the same reasons as the  
29 claims from which they dependent. Accordingly, the rejection of Claims 24-26, and 49 as being  
30 anticipated by Hasson, should be withdrawn.

Furthermore, Claim 49 recites “*wherein the digital video camera is substantially larger than a smallest incision that would be required to insert a laparoscope into a body of a patient.*” As discussed above, Hasson discloses introducing a laparoscopic camera into a practice volume. The laparoscopic camera is either a conventional laparoscopic camera, where the actual camera portion is disposed outside of the practice volume, or the laparoscopic camera is similar to the endoscope disclosed in Adair, with a digital imaging sensor disposed on the distal tip. Such a conventional laparoscope does not anticipate Claim 49, because that type of camera is disposed outside the practice volume (which is different than the configuration recited in applicant’s parent claim). Adair’s endoscope/laparoscope does not invalidate Claim 49, because Adair’s camera (disposed on the distal end of the endoscope/laparoscope) must be smaller than the smallest incision required to insert the laparoscope into the body of a patient. Modifying the distal end of an endoscope/laparoscope to be larger would result in that apparatus no longer being suitable for its intended purpose (i.e., to be able to be introduced into a patient via a small incision). Claim 49 distinguishes over the cited art for this additional reason.

As amended, Claim 50 recites “*a support member configured to slidably engage the housing and to positionably support the boom, thereby enabling the digital imaging sensor to be selectively positioned within the practice volume.*” Support for this recitation in the specification is found in FIGURE 4. In addition, page 17, line 9-18 teaches that the support member, disclosed as a mounting bracket, can pan relative to the support block 60, which is fixedly coupled to or an integral part of housing 60. Hasson discloses laparoscopic camera 146 passing through a support structure 144. There is absolutely no disclosure in Hasson suggesting that support structure 144 moves relative to the housing defining the practice volume (i.e., that support structure 144 slidably engages the housing). Not only does the amended claim language distinguish over the structure disclosed by Hasson, there simply is no evidence that it would have been obvious to one of ordinary skill in the art to modify Hasson’s support structure to achieve that recited in applicant’s Claim 50. It is well accepted that dependent claims must be patentable for at least the same reasons as the claims from which they depend. Accordingly, the rejection of Claims 50-56 as being anticipated by the cited art should be withdrawn.

Claim 51 has been amended simply to resolve an antecedent basis problem caused by adding the support member limitation to Claim 50.

1 Claim 52 as amended recites that the *boom extends from the support member into the practice*  
2 *volume at a substantially non-normal angle*. Support in the specification for this recitation is found  
3 in FIGURES 2, 3, and 4, where it is clear that the boom enters the plane defined by the top of the  
4 practice area at an angle that is clearly not perpendicular. Hasson clearly shows the laparoscopic  
5 camera being introduced into the practice volume at an angle perpendicular or normal to the  
6 horizontal plane, and then deflecting the distal tip of the laparoscopic camera as required to  
7 accommodate a selected viewing angle. Hasson does not teach the recited configuration, and there  
8 simply is no evidence that introducing a boom into the practice volume at a non-normal angle would  
9 solve any problem recognized by the art. Claim 52 thus distinguishes over the cited art for this  
10 additional reason.

11 Claim 53 has been amended to resolve an antecedent basis problem caused by adding the  
12 support member limitation to Claim 50. Further, "in" was deleted from both subsections (a) and (b).

13 Claim 54 as amended further defines the support member as comprising two adjustable  
14 members (the specification as filed discloses an embodiment implementing two brackets). The first  
15 bracket, when actuated, prevents the boom from sliding in and from sliding out of the practice  
16 volume. The second bracket prevents the bracket from sliding or pivoting relative to a shaft of the  
17 support member, thus preventing the boom from tilting (see the directional arrows associated with  
18 mounting bracket 48 in FIGURE 4). The cited art does not teach or suggest an equivalent structure.  
19 Claim 54 distinguishes over the cited art for this additional reason.

20 Claim 55 has been amended to correct an antecedent basis problem caused by adding the  
21 support member limitation to Claim 50, and to recite additional structure that distinguishes over the  
22 cited art. As amended, Claim 55 recites that the support member *comprises a first portion and a*  
23 *second portion, such that the first portion pivotally engages the second portion*. This structure  
24 facilitates the manipulation of the position of the digital camera within the practice volume, and is  
25 clearly illustrated in FIGURE 4 and described in the corresponding text in the specification.  
26 Mounting bracket 48 corresponds to the first portion of the support member, and shaft 62 corresponds  
27 to the second portion of the support member. As indicated by the directional arrows, mounting  
28 bracket 48 pivotally engages shaft 62, enabling a tilting motion to be achieved, thereby enabling  
29 selectively positioning the digital video camera within the practice volume. The cited art does not  
30 teach or suggest such a structure. Claim 55 distinguishes over the cited art for this additional reason.



Independent Claim 60 recites “a digital video camera disposed within the practice volume and wherein the digital video camera is **substantially larger than the smallest incision that would be required to insert a laparoscope into the body of a patient.**” As discussed in detail above with respect to the rejection of Claim 49, Hasson discloses introducing a laparoscopic camera into a practice volume. Any modification of a laparoscopic camera such that it's distal end includes a digital video camera substantially larger than the smallest incision that would be required to insert the laparoscope into the body of a patient is in direct contravention of MPEP 2143.01, and therefore, this reference cannot support an obviousness rejection. Applicant therefore respectfully requests the rejection of Claim 60 be withdrawn.

Independent Claim 61 recites “a digital video camera disposed within the practice volume and the support structure movably supporting the digital video camera **without substantially enveloping the digital camera.**” (Emphasis added.) A digital video camera based laparoscope, as disclosed in Adair, envelopes a digital camera disposed at the distal tip of the laparoscope, to protect the digital video camera from exposure to the body during surgery, and to allow sterilization between surgeries. A conventional laparoscope includes an optical fiber that is coupled to a camera disposed outside of the patient (thus outside of the practice volume). Neither of these laparoscopes simultaneously provides a digital video camera disposed within a practice volume where the digital video camera is not substantially enveloped by a support structure. Therefore, in either case, the prior art does not teach the recited structure. Furthermore, as is discussed in detail above, the modification required to achieve an equivalent structure would render the prior art laparoscope unsuitable for its intended purpose (the digital video camera would be exposed to bodily fluids, completely unsuitable for medical use). Clearly, dependent claims must be patentable for at least the same reasons as the claims from which they depend. Accordingly, the rejection of Claims 61, 62, and 64-70 as being anticipated by the cited art should be withdrawn.

Claim 62 specifically recites that the digital video camera is *substantially larger than the smallest incision that would be required to insert a laparoscope into the body of a patient*, and as discussed above, modifying any of the prior art laparoscopes to achieve an equivalent structure would render those laparoscopes unsuitable for their intended purpose. Claim 62 distinguishes over the cited art for this additional reason.

1 Claim 69 specifically recites a mounting bracket configured to enable a position of the distal  
2 end of the elongate member within the practice volume to be selectively adjustable by pivotally  
3 engaging one of the elongate member and the housing. Hasson discloses a support structure, but  
4 there is absolutely no disclosure to support a conclusion that the support structure pivotally engages  
5 the elongate member or the housing. Nor is there any evidence that such a modification to the  
6 support structure disclosed by Hasson would have been obvious to one of ordinary skill in the art.  
7 Claim 69 distinguishes over the cited art for this additional reason.

8 Claim 70 specifically recites that the digital video camera is “*substantially larger than the*  
9 *smallest incision that would be required to insert a laparoscope into the body of a patient,*” and as  
10 discussed above, modifying a prior art laparoscope to achieve a structure equivalent to what is  
11 claimed by applicant would render the laparoscope unsuitable for its intended purpose. Claim 62  
12 distinguishes over the cited art for this additional reason.

13 The Examiner has rejected Claim 73 as being anticipated by Hasson, while simultaneously  
14 rejecting Claim 72, upon which Claim 73 depends, as being obvious over Hasson in view of Hon.  
15 Applicant respectfully submits that such a rejection is not logical. By recognizing that Hasson does  
16 not teach every element of Claim 72, it must also logically follow that Hasson cannot teach every  
17 element of Claim 73. Furthermore, as discussed in greater detail below, Claim 72 has been amended  
18 to distinguish over the cited art, and Claim 73 is therefore patentable for at least the same reasons.

19 The Examiner has rejected Claims 76 and 77 as being anticipated by Hasson, while  
20 simultaneously rejecting Claim 75, upon which Claims 76 and 77 depend, as being obvious over  
21 Hasson in view of Hon. Applicant respectfully submits that such a rejection is not logical. By  
22 recognizing that Hasson does not teach every element of Claim 75, it must also logically follow that  
23 Hasson cannot teach every element of Claims 76 and 77. Claim 76 specifically recites that the digital  
24 image sensor is substantially larger than the smallest incision that would be required to insert a  
25 laparoscope into the body of a patient. As discussed in detail above, modifying a prior art  
26 laparoscope to achieve a structure equivalent to that recited in the claims would render the  
27 laparoscope unsuitable for its intended purpose. Claim 76 distinguishes over the cited art for this  
28 additional reason.

29 Independent Claim 81 recites *a digital imaging sensor substantially external to the support*  
30 *structure*. As discussed in detail above with respect to the rejection of Claim 24, such a structure

distinguishes over the prior art laparoscopes, and a modification of a prior art laparoscope to place the digital imaging sensor *external* to the support structure would render the laparoscope unsuitable for its intended purpose. Clearly, dependent claims must be patentable for at least the same reasons as the claims from which they depend. Accordingly, the rejection of Claims 81-86 as being anticipated by Hasson should be withdrawn.

Independent Claim 88 has been amended to recite the use of an imaging device, “*wherein the imaging device is substantially larger than a distal end of a conventional laparoscope, such that the imaging device is too large to pass through an incision used to introduce such a conventional laparoscope into a patient.*” As discussed in detail above, there can be no motivation to modify a prior art laparoscope to achieve an equivalent structure, because such a modification would render the laparoscope unsuitable for its intended purpose. Dependent claims are patentable for at least the same reasons as the claims from which they depend. Accordingly, the rejection of Claims 88, 89, and 92 as being anticipated by Hasson should be withdrawn.

Rejection of Claims 57-59, 71, 72, 75, 78-80, 90, and 91 under 35 U.S.C. § 103

The Examiner has rejected Claims 57-59, 71, 72, 75, 78-80, 90, and 91 under 35 U.S.C. § 103 as being unpatentable over Hasson (U.S. Patent Number 5,947,743) in view of Hon (U.S. Patent Number 6,074,213). The Examiner admits that Hasson does not teach every element recited in these claims, but asserts that Hon discloses all missing elements, and that it would have been obvious to one of ordinary skill in the art to incorporate the missing elements disclosed by Hon into Hasson's structure, to achieve an equivalent to the claimed invention. Applicant respectfully disagrees for the following reasons.

Claims 57-59 ultimately depend upon Claim 50, which, as amended, recites “*a support member configured to slidably engage the housing and to positionably support the boom, thereby enabling the digital imaging sensor to be selectively positioned within the practice volume.*” As discussed in detail above, such a structure patentably distinguishes over the structure disclosed by Hasson, and nothing disclosed by Hon would motivate one of ordinary skill in the art to modify a support structure to achieve an equivalent of applicant's claimed invention. It is well accepted that dependent claims are patentable for at least the same reasons as the claims from which they depend. Accordingly, the rejection of Claims 57-59 as being obvious in light of the cited art should be withdrawn.

1 Claim 59 specifically recites that the digital imaging sensor comprises a web camera. The  
2 Examiner is correct that Hon discloses a web camera. However, what is not taught or suggested by  
3 the prior art is that a web camera should be substituted for a laparoscope within the practice volume  
4 of a training simulator. A valid obviousness rejection must not only show that each recited element  
5 was known in the prior art, but also must provide some motivation to combine the elements of two or  
6 more cited references to achieve an equivalent to the claimed invention. Significantly, Hon discloses  
7 two main uses of a video camera. First, the video camera facilitates team practice *"by allowing*  
8 *participants to see not only the central state model changes in the virtual environment, but the*  
9 *actions of the other people involved in the simulation"* (column 6, line 7). Because Hon teaches away  
10 use of a physical anatomical model (column 3, line 1), only the image of manipulation of the  
11 simulated surgical tools are broadcast. Second, the video camera facilitates communication between  
12 team members: *"...team members may have communication between each other that are parallel to*  
13 *inputs and outputs of the event-driven state model, by means of voice transmission or by live video*  
14 *cameras"* (column 6, line 19). In other words, Hon teaches a video camera as a means of bridging  
15 geographic distances to simulate a procedure that could otherwise only take place when all parties are  
16 in the same location. Hasson teaches the laparoscopic camera as a part of the training itself, not a  
17 means to accomplish training over distances: *"The camera 146 may produce a signal that is directed*  
18 *to a monitor 148 which produces a two dimensional image of the inside of the working space 14."*  
19 (Column 5, line 47). The image from inside the working space simulates what a surgeon would see  
20 during actual surgery, specifically the distal ends of the surgical tools and the tissue being operated  
21 on. Hon teaches a video camera capturing an image of the user manipulating virtual instruments,  
22 while Hasson teaches the laparoscopic camera capturing an image of the local, physical model as it is  
23 manipulated by the user. Because the cameras are taught for different uses, there is no evidence to  
24 suggest a person having ordinary skill in the art would be motivated to combine Hon and Hasson to  
25 achieve an equivalent invention. Claim 59 is distinguishable over the cited art for this additional  
26 reason.

27 Claim 71 ultimately depends upon independent Claim 61, which, as amended, recites *"a*  
28 *digital video camera disposed within the practice volume and the support structure movably*  
29 *supporting the digital video camera without substantially enveloping the digital camera."*  
30 (Emphasis added.) As discussed in detail above, an obviousness rejection fails if based on modifying

1 a prior art laparoscope such that the prior art laparoscope is unsuitable for its intended purpose.  
2 Because dependent claims are patentable for at least the same reasons as the claims upon which they  
3 depend, Claim 71 is patentable for at least the same reasons as Claim 61. Further, Claim 71 defines  
4 the digital video camera as a web camera, and as is discussed immediately above with respect to the  
5 rejection of Claim 59, the use of a web camera distinguishes over the cited art. Claim 71  
6 distinguishes over the cited art for this additional reason.

7 Independent Claim 72, as amended, specifically recites that the digital image sensor *is not a*  
8 *laparoscope*. All negative limitations are somewhat unusual, but they are not inherently  
9 unacceptable. As long as the specification provides support for the negative limitation, negative  
10 limitations must be analyzed as any other claim limitation. The specification as filed clearly  
11 describes why the use of laparoscopes in training situations is undesirable (because laparoscopes are  
12 expensive, high-quality devices unsuitable for widespread use in a training device). The specification  
13 clearly teaches that Web cameras, while not suitable for actual medical applications, are well-suited  
14 as an inexpensive substitute for a high-priced laparoscope, for training purposes. This point is very  
15 relevant to a benefit of applicant's invention. Applicant clearly teaches away from the use of a  
16 laparoscope or endoscope in the surgical trainer in favor of simulating a laparoscope or endoscope  
17 with a substitute digital imaging sensor, such as a digital video camera (such as a web camera) that is  
18 not configured for medical use within the body of a patient. Accordingly, the rejection of Claim 72  
19 as being obvious in view of Hasson and Hon should be withdrawn.

20 Independent Claim 75 specifically recites that *the digital image sensor is substantially*  
21 *external to the support structure*. Therefore, the digital image sensor as claimed is not enclosed  
22 within the support structure. Such a configuration is distinctly different than the structural  
23 configuration of any prior art laparoscope, and so, the cited art does not read on Claim 75. Any  
24 modification to dispose the digital image sensor outside of the support structure would render prior  
25 art laparoscopes unsuitable for their intended use, because the digital image sensor would be exposed  
26 to bodily fluids. MPEP 2143.01 quite clearly states that obviousness cannot be established by such a  
27 modification (i.e., a modification that makes a prior art device unsuitable for its intended purpose).  
28 Because dependent claims are patentable for at least the same reasons as the claims from which they  
29 depend, each claim depending upon Claim 75 must be patentable for at least the same reasons.

1 Accordingly, the rejection of Claims 75 and 78-80 as being obvious in view of Hasson and Hon  
2 should be withdrawn.

3 Claims 78 and 79 generally recite that the output of the digital image sensor is stored in a  
4 memory storage medium for later use. Hasson discloses using an externally disposed camera to  
5 record and store a video signal. Hon discloses a web camera; any output from Web cameras can  
6 generally be stored. However, the cited art simply does not teach or suggest storing a video signal  
7 that is captured by a digital video camera disposed *within a practice volume*. The modifications  
8 required to achieve an equivalent of applicant's claimed invention are not suggested by the cited art.  
9 Absent the application of impermissible hindsight, there appears to be no motivation to modify the  
10 references to achieve an equivalent of applicant's claimed invention. Claims 78 and 79 are  
11 distinguishable over the cited art for this additional reason.

12 Claims 90 and 91 are ultimately dependent upon independent Claim 88, which as described  
13 above, has been amended to recite the use of a imaging device, "*wherein the imaging device is*  
14 *substantially larger than a distal end of a conventional laparoscope, such that the imaging device is*  
15 *too large to pass through an incision used to introduce such a conventional laparoscope into a*  
16 *patient.*" As discussed in detail above, there can be no motivation to modify a prior art laparoscope  
17 to achieve an equivalent to applicant's claimed structure, because such a modification would render  
18 the laparoscope unsuitable for its intended purpose. Dependent claims are patentable for at least the  
19 same reasons as the claims from which they depend. Accordingly, the rejection of Claims 90 and 91  
20 as being obvious in view of the cited art should be withdrawn.

21 Piecemeal Examination

22 The Examiner has suggested that he may issue a restriction requirement in a future action.  
23 Applicant is particularly troubled that the Examiner has not yet issued a restriction requirement,  
24 particularly if the Examiner believes that there is a reasonable basis to do so. Failure to raise a timely  
25 restriction requirement is prejudicial to the applicant, as it forces the applicant to respond to  
26 rejections which ultimately will become moot because the Examiner has issued a restriction  
27 requirement. Such an examination is very inefficient, and contrary to US PTO policy and procedure.  
28 MPEP 707.07(g) makes it clear that piecemeal examination is to be avoided whenever possible.  
29 Applicant is not attempting to traverse a potential restriction requirement on this basis, but instead,  
30 points out that such a restriction requirement should be raised in an initial office action, rather than

1 after both applicant and the Examiner have expended effort prosecuting claims that might be  
2 withdrawn from consideration due to a restriction requirement that was not issued in a timely manner.

3 Secondary Considerations of Novelty

4 The declaration of Christopher Toly submitted concurrently herewith indicates that a surgical  
5 trainer corresponding to the trainer recited in the pending claims received the Society of  
6 Laparoscopic Surgeons "Innovation of the Year" award in 2004. The trainer included a web camera  
7 disposed on the distal end of the boom extending into a practice volume. The trainer was sold  
8 without a display, and has been used with great success by medical professionals and medical  
9 students, who attach the web camera to a desktop or laptop computer during training. Two key  
10 features made this trainer particularly successful. First, the images displayed are a highly realistic  
11 simulation of images that would be displayed by an actual laparoscope. Second, the substitution of a  
12 web camera for laparoscope enables a very inexpensive, yet high-quality trainer to be achieved.  
13 Laparoscopes are very sophisticated and very expensive pieces of medical equipment. An  
14 inexpensive trainer that is configured to be used with ubiquitous computing devices already typically  
15 present in medical offices and educational environments can be much more widely distributed than a  
16 training device requiring the use of a relatively expensive laparoscope camera. Applicant  
17 respectfully submits that the Innovation of the Year award should be considered as secondary  
18 evidence relating to the commercial success of the product, as well as evidence that the claimed  
19 invention meets a long felt need for a realistic, yet inexpensive training simulator. Such secondary  
20 considerations are hereby submitted to traverse the obviousness rejections presented by the Examiner.  
21 In light of such secondary considerations, as well as the remarks presented above, applicant  
22 respectfully requests the Examiner to withdraw the obviousness rejections.

23 The Examiner is thus request to pass this application to issue without delay. Should any  
24 further questions remain unresolved, the Examiner is invited to telephone applicant's attorney at the  
25 number provided below.

26 Respectively submitted

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